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Grasses of the National Forests of the Rockies

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In the revised edition of the Manual of the Botany of the Rocky Mountain region by J. M. Coulter and Aven Nelson* something over 220 species of grasses are listed. These are distributed in 65 genera. In a paper on the grasses of the Uintah Mountains and adjacent regions by the writer, 126 species are listed and 36 genera.† Thomas Howell, in his "Flora of Northwest America", lists about 315 species of grasses including the varieties. Among the species found in northwest North America are many introduced plants, a larger number than in the Rocky Mountains. In the Pacific Northwest there are a great many more species of *Agrostis*, 23 in all, than in the Rocky Mountains, where the genus is represented by only 9 species. The Rocky Mountain region has 10 species and varieties of *Calamagrostis*, whereas, there are 23 in the Pacific Northwest. There are 25 species of the meadow grasses (*Poa*) in the Rocky Mountains and 41 in the Pacific Northwest. Brome grasses (*Bromus*) have 26 in the Pacific Northwest and 10 in the Rocky Mountains; mesquite grass (*Bouteloua*) a single species in the Northwest, and then, only on the eastern border of Washington and Oregon, and 4 species in the Rocky Mountain region. Of the grasses mentioned above the genus *Bouteloua* has a diverse range, extending from Mexico to the Eastern States, but nowhere else does *Bouteloua* reach so great a development as in the region west of the 100th meridian and east of the Northern Rockies, and in the Southwest. The meadow grasses (*Poa*) are typical of the mountain meadows and northern regions, though some species work out on the plains, like the meadow grass (*Poa arida*) and Blue grass (*Poa pratensis*) which is frequently associated with hair grass (*Deschampsia caespitosa*) and blue joint (*Calamagrostis*

* A Manual of the Botany of the Central Rocky Mountain region. Vascular Plants. Am. Book Co., 1909.

† Proc. Ia. Acad. Sci. 1913: 123-149.



Blue Grass (*Poa pratensis*). A—Spikelet with several flowers.
B—Cobwebby hairs on lemma. In the Rocky Mountains and the
eastern states. (U. S. Dept. Agr.)



Hairy Brome Grass (*Bromus marginatus*.) A—Spikelet with three florets. B—Dorsal view of lemma. Common in the northern Rockies. (U. S. Dept. Agr.)

neglecta). In the Alpine meadows of the Colorado district *Poa Lettermannii*, and Chess, or Brome grass (*Bromus*), are plants of the mountains, stream and meadows except as the introduced species occupy waste places.

The grasses are so important to the forester that a few of the more common species of the forest reserves should be recognized. They are, of course, among the most difficult plants to recognize. Many of the species are so widely distributed and occur under so many different conditions that it is difficult always to mark their limitations. This is true for such grasses as common blue



Spikelet of Slough Grass (*Spartina cynosuroides*.) Lower scales sterile glumes, the third scale lemma, fourth scale palea, followed by stamens and pistil. (Gray-King).



Gama Grass (*Boutelous curtipendula*.) Lower scales; third scale lemma; fourth scale palea. (Gray-King).

grass (*Poa pratensis*) which occurs in mountain regions generally in the West. The mountain timothy though common in the Rocky Mountains is a fairly constant species. A few of the grasses are easily recognized; Alpine timothy by its black head; Squirrel tail by the bushy top; Melica by the bulbous "root"; meadow grasses by the cobwebby lemma (some, of course, not being cobwebby). A few of the grasses have involute leaves (like *Festuca ovina* and *F. rubra*). Twisted, annual seeded grasses belong to *Stipa* (a single awn) and *Aristida* with a 3-branched awn. Some of the wheat grasses have many root-

stocks and a rachis that is zigzag. The following key will help somewhat to identify a few grasses:

- A. Rachilla articulated below the spikelets, falling away entire, 1-2 flowered (spikelets in pairs, one sessile, the other pedicellate, Blue Stem (*Andropogon*) on the plains. *Hilaria* with inflorescence in a terminal spike, New Mexico).
- B. Spikelets with persistent glumes, the rachilla articulated above them.
 1. Spikelets 1-flowered.
 - a. Lemma with long terminal awn.
 - aa. Awns 3-branched *Aristida*
 - aa. Awns simple, twisted *Stipa*
 - b. Awns comparatively short.
 - bb. Sheaths smooth.
 - c. Plant slender *S. columbiana*
 - c. Plant stout *S. viridula*
 - b. Awn long *S. comata*
 - a. Lemma awnless or with a short awn.
 - aa. Inflorescence a dense spike *Phleum*
 - b. Upper sheath not inflated, color greenish .. *P. pratense*
 - b. Upper sheath inflated, color dark *P. alpinum*
 - aa. Inflorescence loose.
 - b. Pericarp discharging the seed *Sporobolus*
 - b. Pericarp not discharging the seed.
 - c. Lemma naked at base *Agrostis*
 - c. Lemma with a tuft of hairs *Calamagrostis*
 1. Spikelets 2 to many flowered.
 - a. Awns usually dorsal and usually bent.
 - b. Lemma erose truncate *Deschampsia*
 - b. Lemma 2-toothed *Trisetum*
 - a. Awn of lemma terminal between the teeth *Danthonia*
 1. Spikelets in two rows sessile or nearly so in a one-sided spike.
 - a. Flowers perfect.
 - b. Spikelets falling off as a whole. Spikelets flattened
Beckmannia
 - b. Spikelets in part persistent.
 - a. Flowers imperfect. Staminate and pistillate *Buchloe*
 1. Spikelets 2 to many flowered. Lemma usually longer than the glumes.
 - a. Awn terminal, straight, lemma usually shorter than the glume.
 - b. Inflorescence spike-like, lemma 3-nerved *Koeleria*
 - b. Inflorescence in an open panicle. Lemma 5 or more nerved.
 - c. Upper florets sterile, folded about each other, bulbous *Melica*
 - cc. Stigmas below the apex of the ovary.
 - ccc. Spikelets with upper floret abortive
Bromus
 - d. Lower glume 1-nerved
B. Pampellius
 - d. Lower glume 3-nerved, sheaths hairy *B. larginatus*
 - cc. Stigmas arising at the apex of the ovary.
 - d. Lemma compressed and keeled.
 - dd. Awnless *Poa*
 - e. Lemma webbed.
 - ee. Panicle large, not reflexed *P. pratensis*

- ee. Panicle small reflexed
 - P. reflexa*
- e. Lemma not webbed.
 - Panicle large...*P. nevadensis*
 - Panicle small...*P. buckleyana*
- d. Lemma convex or rounded...*Festuca*
- e. Leaves involute.....*F. rubra*
- e. Leaves broad and flat...
 - F. scabrella*
- 1. Spikelets in one sided, jointed, channeled rachis.
 - a. Spikelets generally solitary on the rachis.....*Agropyron*
 - b. Creeping rootstocks absent.....*A. tenerum*
 - b. Creeping rootstocks present.
 - bb. Spikelets dense 7-13 flowered, leaves rough on edge*A. Smithii*
 - bb. Spikelets 3-8 flowered.
 - bbb. Glumes short, $\frac{1}{2}$ the length of the spikelet
 - A. dasystachyum*
 - bbb. Glumes longer, $\frac{2}{3}$ as long as the spikelet
 - A. pseudo-repens*
 - a. Spikelets 1-flowered, the mature plant readily breaks into pieces*Hordeum*
 - b. Spikes with spreading awns, usually reddish.....
 - H. jubatum*
 - b. Spikes narrower; awns erect.....*H. nodosum*

Some of the more important and common grasses of the forest regions of the Rockies are as follows:

- Western wheat grass (*Agropyron Smithii*). Ranges from western Iowa to the Pacific coast in open places and on plains at lower altitudes.
- Slender wheat grass (*Agropyron tenerum*). Along streams and in meadows in the Rocky Mountains; common at lower altitudes, particularly in Wyoming, Montana and northern Colorado.
- Awned wheat grass (*Agropyron dasystachyum*). With creeping rootstocks; common in open woods and meadows with dry soil.
- Short awned Brome grass (*Bromus marginatus*). A tall grass; common at low altitudes in northern Wyoming, Colorado and Montana, but less common in New Mexico along the streams and in the meadows.
- Awnless Brome grass (*Bromus pumpellianus*). Found far northward and westward, occurring in northern Colorado in moist parks.
- Fescue grass (*Festuca rubra*). In dry places, growing in benches everywhere in the mountains of Colorado.
- Bunch grass (*Festuca scabrella*). One of the fescue grasses; common everywhere in drier mountain parks of Colorado, Wyoming and northward.
- Blue grass (*Poa pratensis*). Common in moist mountain parks and meadows in the Rockies. This grass is truly indigenous in the Rockies.
- Meadowgrass (*Poa Lettermannii*). At high altitudes in the Rockies, Gray Peak, Mount Ouray, etc.
- Nevada blue grass (*Poa nevadensis*). Forms benches in open woods.
- Buckley's meadow grass (*Poa Buckleyana*). Occurs in the open, dry, semi-arid regions.
- Mesquite grass (*Bouteloua oligostachya*). Common on the plains and in the foothills. Occurs from western Iowa to eastern Washington and New Mexico and Utah.



Fescue Grass (*Festuca pratensis*). Naturalized at low altitudes. A—Spikelet. (Lamson-Scribner, U. S. Dept. of Agr.)

Buffalo grass (*Buchloe dactyloides*). Another grass of the open. Occurs as far south as New Mexico, but rarer in this state than in Colorado.

Wild Timothy (*Beckmannia erucaeformis*). A sub-equatic in the Rocky Mountains and the Uintah mountains, up to an altitude of 6,000 feet, and at lower altitudes in the north.

Red top (*Agrostis alba*). An introduced grass; common in low meadows of the Rockies, especially where irrigation is practiced.

Timothy (*Phleum pratense*). Occurs everywhere in the Rockies. The most widely distributed of the introduced grasses. At lower altitudes in meadows, and at higher altitudes frequently along roadsides and trails.

Mountain Timothy (*Phleum alpinum*). In mountain meadows. Sub-alpine throughout the Rocky Mountains.

Bunch grasses:

(*Stipa viridula*). Common at lower altitudes in open woods and parks.

(*Stipa columbiana*). Common in the mountains and open parks.

(*Stipa comata*). A grass of the plains and foothills.

California oats grass (*Danthonia californica*). In open parks at altitudes of from 7,000 to 9,000 feet. Is common from Colorado to Montana and westward.

- Oat grass (*Trisetum subspicatum*). Common on mountain slopes throughout the Rocky Mountains.
- Hair grass (*Deschampsia caespitosa*). Is frequent in the moist meadows at 6,000 feet in Utah. Generally 7,000 to 9,000 feet. Everywhere in the Rockies and across the continent.
- Squirrel tail grass or wild barley (*Hordeum jubatum*). Common in alkaline soils, meadows and marshes, and on the borders of irrigation ditches throughout the Rocky Mountain region.
- Wild barley (*Hordeum nodosum*). Common also in saline meadows at higher altitudes.
- Melic grass (*Melica bulbosa*) and (*M. spectabilis*). Are common in the mountains of especially Colorado, Utah and Wyoming, usually occurring in the thickets or in open parks.
- Koeleria (*Koeleria cristata*). Common in dry soils and parks in the Rocky Mountains and eastward across the continent, generally at low altitudes.
- Drop seed grasses (*Sporobolus*). There are several common species, usually of the bench lands. Most of the species are invaders from the south, southeast or east.
- Vanilla grass (*Hierichloe odorata*). A sweet-scented grass, common in meadows of the Rocky Mountain country and extending eastward across the country.